

AMENDMENTS TO THE CLAIMS

Claims 1-10. (canceled)

Claim 11. (Currently Amended) An orthogonal frequency division multiplexing (OFDM) system for transmission of a multi-amplitude digital modulated signal from a transmitter to a receiver via a radio channel, wherein;

~~—on the transmitter side, phase differential encoder means (5) are provided for differentially modulating subsequent symbols on the same subcarrier;~~

~~—on the receiver side, differential phase decoding means (21) are provided for demodulating said respectively subsequent symbols on said same subcarrier, and in that~~

~~—means are provided on said both sides for coherent processing of the amplitudes of said signals;~~

said transmitter is adapted to process a coded data stream with a block frame structure consisting in each frame of a sequence of n quadrature phase shift keyed (QPSK) control symbols followed by m sixteen quadrature amplitude modulated (16 QAM) data symbols, where n and m are integers, ~~and the transmitter~~ comprising:

- a demultiplexer means (1) for separating said control symbols and said data symbols, and

- for feeding said control signals to QPSK modulator means (2) for mapping of two bits each into QPSK complex symbols and for supplying said data symbols to a 16 QAM modulator means (3) for mapping of four bits each into 16 QAM complex symbols,

- first multiplexing means (4) for multiplexing said QPSK complex symbols and said 16 QAM complex symbols and for supplying the resulting data stream to

- a phase differential encoder means (5) for differential modulation of the phases of respectively subsequent symbols on a same subcarrier and keeping the respective amplitudes of said symbols unchanged,

- second multiplexing means (7) for transferring the resulting data symbol stream into OFDM signals that are subject to an inverse fast Fourier transformation (8) to produce a baseband OFDM-modulated signal,

- quadrature modulator means (10) for modulating said baseband signal with carriers having 90° phase difference and supplying the thus modulated signal to

- D/A-converter means (11) followed by an up-converter means (11) to hook the analog D/A-converter output signal to a given carrier frequency for transmission; and

wherein said receiver has differential phase decoding means (21) for demodulating said respectively subsequent symbols on said same subcarrier; and means for coherent processing of the amplitudes of said signals.

Claim 12. (Original) The OFDM system of claim 11, characterized in that null symbol generating means (6) are provided for setting unused subcarriers leaving said phase differential encoder means (5) at the band edges to zero.

Claim 13. (Previously Presented) The OFDM system of claim 11, characterized in that for reducing multipath interference effects a guard interval inserting means (9) is provided for inserting before each symbol a copy of a defined number of the last samples of the inverse fast Fourier transformed time domain OFDM symbols.

Claim 14. (Currently Amended) An orthogonal frequency division multiplexing (OFDM) system for transmission of a multi-amplitude digital modulated signal from a transmitter to a receiver via a radio channel, wherein,

~~— on the transmitter side, phase differential encoder means (5) are provided for differentially modulating subsequent symbols on the same subcarrier,~~

~~— on the receiver side, differential phase decoding means (21) are provided for demodulating said respectively subsequent symbols on said same subcarrier, and in that~~

~~— means are provided on said both sides for coherent processing of the amplitudes of said signals;~~

said receiver is adapted to receive, process and demodulate said radio channel transmitted signal, the receiver ~~and~~ comprising:

- a down-converter means (14) for converting the received signal from said carrier frequency down to an intermediate frequency;
- analogue-to-digital converter means for digitizing said intermediate frequency signal;
- a quadrature demodulator means (16) for detecting and generating a baseband signal from said A/D-converted intermediate frequency;

- a time synchronizing means (17) for generating a window for fast Fourier transformation (FFT) indicating the effective symbol portion of the OFDM signal;
- a fast discrete Fourier transformation means (18) for producing complex frequency domain symbols of said effective symbol portion of the OFDM signal;
- first demultiplexer means (19) for demultiplexing the FFT transformed OFDM signal into useful data and for canceling unused subcarriers at the band edges;
- phase differential decoder means (21) for demodulating the phases of subsequent symbols on the same subcarrier with simultaneous coherent processing of the amplitudes;
- second demultiplexer means (22) for separating Quadrature Phase Shift Keyed (QPSK) symbols and Quadrature Amplitude Modulated (QAM) symbols;
- QPSK demodulator means (26) for demapping of said QPSK complex symbols into corresponding bits;
- QAM demodulator means (27) for demapping of said QAM complex symbols into corresponding bits; and
- third multiplexing means (28) for multiplexing of said demodulated QPSK bits and said demodulated QAM bits according to the adopted frame structure; and

wherein said transmitter has phase differential encoder means (5) for differentially modulating subsequent symbols on the same subcarrier, and means for coherent processing of the amplitudes of said signals.

Claim 15. (Original) The OFDM system of claim 14, characterized in that the QPSK complex symbols output from said second demultiplexer means (22), on the one hand, are sent via hardlimiter means (23) to said QPSK demodulator means (26) and, on the other hand are sent to an amplitude distortion determining mean for generating a running means of the respective QPSK signal, and in that the QAM complex symbols output by said second demultiplexer means (22) is supplied to an amplitude correction means (25) for amplitude correction according to the respective running means of amplitude before supplying the amplitude corrected QAM complex symbols to said QAM demodulator means (27).